Spectrophotometry

2007, Dr. Matthew Stremlau

Why Old World monkeys are resistant to HIV-1

Premature disassembly of the HIV-1 capsid is caused by the rhesus monkey protein, TRIM5α, and a single amino acid change in human TRIM5α confers similar anti-HIV-1 activity. Dr. Stremlau's grand-prize winning essay describes how, using a genetic screen, TRIM5α was identified as the primary block to HIV-1 replication in Old World monkey cells.

Dr. Stremlau received his BS in chemistry from Haverford College. After graduation, he spent 1 year as a Henry Luce Fellow at the National Laboratory for Agrobiotechnology in Beijing, China, before beginning graduate studies at Harvard University. Here Dr. Stremlau investigated retroviral restriction in nonhuman primates in Dr. Joe Sodroski's laboratory. While at Harvard, Dr. Stremlau cofounded the International Science and Health Network, an equipment recycling program that sends scientific equipment to laboratories in the developing world.

He currently works in the U.S. Global AIDS Coordinator's Office at the State Department as an American Association for the Advancement of Science Fellow. Dr. Stremlau plans to start a postdoctoral fellowship in 2008 and is interested in emerging biotechnologies relevant to the developing world.

GE & Science Prize for Young Life Scientists is supported by GE Healthcare and the journal Science, which is published by AAAS, the nonprofit society.
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Further information on how to enter, plus past winners and their essays can be found at:
www.gelifesciences.com/science

Chapter 12

UV/Visible Spectrophotometers

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Software 655

System Control Software 655
Data Exportation Software 655
NEW Installation Qualification/Operational Qualification (IQ/OQ) 655

made2measure

Products in this chapter can be customized to your precise requirements, including small-scale packs, concentrations, special blends, specific QC testing, and scale-up.

In addition, we offer a "Room-Temperature Stable" reagent development and manufacturing service where we develop your -20°C reagents and kits for storage and shipping at room temperature.

Our manufacturing standards are certified to ISO 9001:2000 with Six Sigma implementation throughout the manufacturing process.

Contact us for more information at made2measure@ge.com, and visit us on the web at www.gelifesciences.com/custom.

To ensure that we handle your inquiry efficiently, please provide the product name, catalog code, and volume requirements.

Supported by Labcrew

All instruments in this chapter are supported by Labcrew, your GE Healthcare equipment professionals. We provide Service Agreements and Preventive Maintenance to keep your instrument running in peak condition. Additional services include equipment de-installation/re-installation and software/hardware upgrades. Visit www.gelifesciences.com/labcrew for more information.

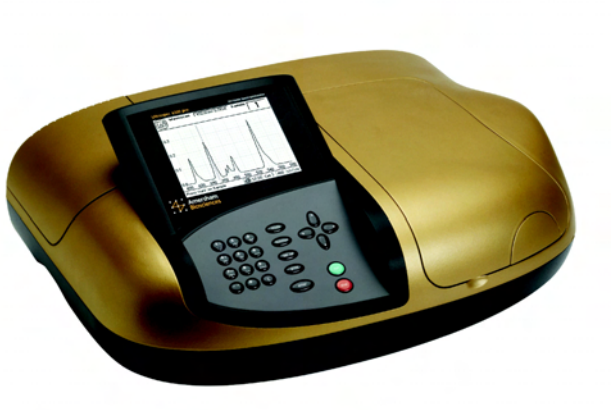
Spectrophotometer selection guide

What application(s) are you working on?

- Bacterial cell culture only → Ultrospec 10
- Nucleic acid purification and amplification → GeneQuant 100
- Protein and enzyme studies → Novaspec Plus or Novaspec III
- Multiple applications → Do you want to use a drop-and-read mechanism or cuvettes?
  - Drop-and-read mechanism → NanoVue
  - Cuvettes → Do you need Pharmacopoeia compliance?
    - Yes → Would you prefer a stand-alone instrument or PC-control?
      - PC-Control → Ultrospec 5300 *pro*
      - Stand-alone → Ultrospec 6300 *pro*
    - No → Do you need temperature control or multiple sample holders?
      - Yes → Ultrospec 2100 *pro* Ultrospec 3100 *pro*
      - No → GeneQuant 1300

Supported by Labcrew

Ultrospec 6300 *pro* UV/Visible Spectrophotometer



Stand-alone, fully Pharmacopoeia compliant instrument with a high resolution graphics display and press to read lamps. Shown in Gold color option.

- ***Meets the demanding requirements of the Pharmacopoeia in terms of instrument specification and GLP self-diagnostics, with the benefits of being able to be used for rapid, discrete measurements.***
- Bandwidth of 1.0 nm and excellent scanning capability.
- Press-to-read, high-performance deuterium and tungsten lamps for reduced cost of ownership.
- Built-in applications software with capability for 50 stored methods.
- Includes cDNA application software for measuring the incorporation of Cy3, Cy5, fluorescein, and user-specified dyes into purified microarray hybridization probes and PCR products.
- Provides display and print-out information in English, German, French, Italian, Spanish or Russian.

Ultrospec 6300 *pro* is intended for the busy multi-user laboratory environment encountered in many pharmaceutical and bio-pharmaceutical companies. Here, use of an instrument conforming to the Pharmacopoeia may be a requirement, even if many measurements are discrete, as opposed to being part of a method development program. Therefore, the instrument has a Qualification and Performance Verification Logbook supplied as standard. Using this, an ongoing record of instrument performance can be maintained for GLP purposes. For users who do not require the high resolution of a 1 nm bandwidth instrument, the Ultrospec 3300 *pro*, with a 1.8 nm bandwidth, is also available.

Ultrospec 6300 *pro* has built-in applications software for wavelength scanning, enzyme kinetics, standard curve, substrate concentration, and multiwavelength equation entry software. In addition, it has stored protocols for nucleic acid quantitation, protein determination, and a facility for quantitation of Cy3, Cy5, fluorescein, and user-definable labeled cDNA probes for microarray studies; these are particularly suitable for use with our CyScribe Labeling kits.

With its extensive range of built-in software, direct download to Microsoft Excel, a wide range of accessories (including a Sipper option) and GLP self-test diagnostics, Ultrospec 6300 *pro* is a reliable, compact and integrated system. It can also be connected to a PC for complete control by SWIFT II Applications Software if required.

For conversion data for nucleic acids and proteins, see the Technical Appendix.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 6300 *pro*, Gold (1.0 nm bandwidth)	1	80-2117-55
Ultrospec 6300 *pro*, Classic (1.0 nm bandwidth)	1	80-2117-60
Ultrospec 6300 *pro*, Yellow (1.0 nm bandwidth)	1	80-2117-61
Ultrospec 6300 *pro*, Plum (1.0 nm bandwidth)	1	80-2117-62
Ultrospec 6300 *pro*, Apple (1.0 nm bandwidth)	1	80-2117-63

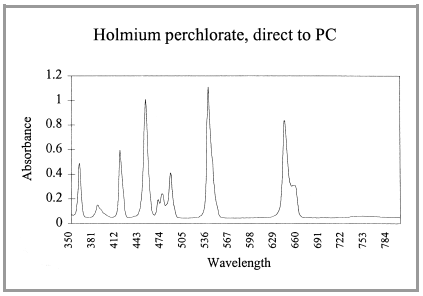
Includes: Qualification and Performance Verification Logbook, Spreadsheet interface software and serial interface cable, Automatic wavelength calibration on startup, GLP self diagnostics, integral high resolution liquid crystal display with graphical user interface, integrated software with post-run calculations, 8-position cell changer. Available in a choice of colors.

For pricing information, visit www.gelifesciences.com/orderonline

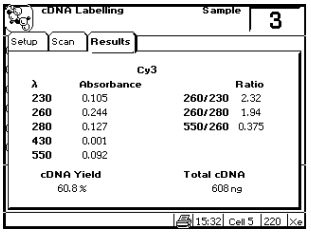
Related Products	Refer To
21 CFR part 11 compliant SWIFT II Applications Software	page 654
SWIFT II Applications Software	page 655
UV/Visible Cells	page 651
Accessories for Spectrophotometers	page 652
Amersham CyScribe First-Strand cDNA Labeling Kit	page 338
Amersham CyScribe Post-Labeling Kit	page 339
Amersham CyDye Fluorescent Nucleotides	page 342

TECHNICAL SPECIFICATIONS

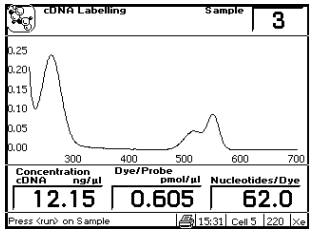
Wavelength range	190–1100 nm in 0.1 nm data steps
Bandwidth	1.0 nm
Absorbance range	-3.000 to 3.000
Safety certifications	CE 89/336/EEC (EMC directive) CE 73/23/EEC (LV directive) EN-61010-1 (IEC1010-1)



As well as fulfilling the European Pharmacopoeia (supplement 2000) resolution test (product specific), Ultrospec 6300 *pro* can export results directly to Microsoft Excel.



Screen shot of all calculated results and useful ratios.



Screen shot of Cy3-labeled cDNA probe scan showing raw scan data and calculated values.

Supported by Labcrew

Ultrospec 5300 *pro* UV/Visible Spectrophotometer

PC-controlled instrument fulfilling Pharmacopoeia requirements. Shown in Gold color option.

- ***Meets the demanding requirements of pharmacopoeia standards in terms of instrument specification, GLP self-diagnostics and audit trail (SWIFT II Applications Software).***
- Bandwidth of 1.0 nm and excellent scanning capability.
- Press-to-read, high-performance deuterium and tungsten lamps for reduced cost of ownership.
- Supplied with SWIFT II-METHOD application software.
- Supplied with an 8-position cell changer and serial interface cable.
- Uses minimal bench space, and optional support provides space for a laptop PC.

Ultrospec 5300 *pro* is a high-specification product with a bandwidth of 1.0 nm that meets pharmacopoeia resolution tests. Its GLP self-diagnostics mean it can be easily checked against published specifications. An informative print-out is available for record keeping. A Qualification and Performance Verification Logbook is available so that key instrument specification parameters can be checked as a function of time; essential in the pharmaceutical and drug discovery industries. SWIFT II Applications Software, supplied with the instrument, provides modules for wavelength scanning, reaction kinetics, time drive, quantitation, multiwavelength, fraction analysis, cell culture, and T_m experiments. An 8-position sample changer is supplied as standard for simple and fast sample handling. For users who do not require the high resolution of a 1 nm bandwidth instrument, the Ultrospec 4300 *pro*, with a 1.8 nm bandwidth, is also available.

Ultrospec 5300 *pro* satisfies the high specifications for resolution, noise, stability, wavelength accuracy, and reproducibility that are necessary for detailed spectral scanning. In conjunction with a wide range of accessories, the instrument is suitable for many applications in the method development and Quality Control laboratories in industry and in general laboratories in research institutions.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 5300 *pro*, Gold (1.0 nm bandwidth)	1	80-2117-56
Ultrospec 5300 *pro*, Classic (1.0 nm bandwidth)	1	80-2117-70
Ultrospec 5300 *pro*, Yellow (1.0 nm bandwidth)	1	80-2117-71
Ultrospec 5300 *pro*, Plum (1.0 nm bandwidth)	1	80-2117-72
Ultrospec 5300 *pro*, Apple (1.0 nm bandwidth)	1	80-2117-73

Includes: 8-position sample changer, GLP self-diagnostics, SWIFT II-METHOD software (Windows 95), serial interface cable.
Available in a choice of colors.

For pricing information, visit www.gelifesciences.com/orderonline

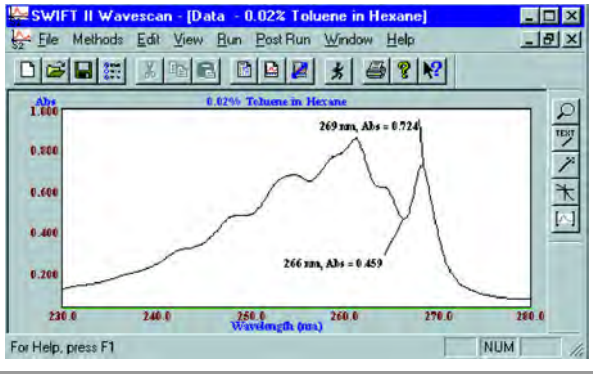
Please contact your local GE Healthcare office for computer and printer specifications.

Related Products	Refer To
21 CFR part 11 compliant SWIFT II Applications Software	page 654
SWIFT II Applications Software	page 655
UV/Visible Cells	page 651
Accessories for Spectrophotometers	page 652

TECHNICAL SPECIFICATIONS

Wavelength range	190–1100 nm in 0.1 nm data steps
Bandwidth	1.0 nm
Absorbance range	-3.000 to 3.000
Safety certifications	CE 89/336/EEC (EMC directive) CE73/23/EEC(LVdirective) EN-61010-1 (IEC1010-1)

For conversion data for nucleic acids and proteins, see the Technical Appendix.


SWIFT II Wavescan - [Data - 0.02% Toluene in Hexane]
File Methods Edit View Run Post Run Window Help
0.02% Toluene in Hexane
Abs
269 nm, Abs = 0.724
266 nm, Abs = 0.459
Wavelength (nm)
For Help, press F1
NUM

European Pharmacopoeia (Supplement 2000) test for resolution. This test states that in order to verify the resolution of the instrument, record the spectrum of a 0.02% (*v/v*) solution of *toluene R* in *hexane R*. The minimum ratio of the absorbance at the maximum (around 269 nm) to that at the minimum (around 266 nm) is stated in the monograph.

Supported by Labcrew

Ultrospec 3100 *pro* UV/Visible Spectrophotometer

Incorporates a high-resolution liquid crystal display and built-in cDNA application software. Shown in Yellow color option.

- ***Displays graphics via an intuitive and easy-to-use interface on a high resolution liquid crystal screen.***
- Xenon lamp for longer lifetime by incorporating press-to-read technology and lower running costs (three-year lamp warranty).
- Includes built-in applications software for wavelength scanning, enzyme kinetics, standard curve, substrate concentration, and multi-wavelength equation entry.
- Includes cDNA application software for measuring incorporation of Cy3, Cy5, fluorescein, and user-specified dyes into purified microarray hybridization probes and PCR products.
- Accommodates 50 user-stored methods, making it suitable for the busy multi-user or Quality Control laboratory.
- Provides display and print-out information in English, German, French, Italian, Spanish or Russian.

Ultrospec 3100 *pro* is the ideal UV/visible spectrophotometer for the demanding laboratory where bench space is at a premium. Its many features include stored protocols for protein determination (Bradford, Biuret, Lowry and BCA) and nucleic acid quantitation/characterization (DNA, RNA, oligonucleotide, theoretical T_m calculation). The Ultrospec 3100 *pro* has built-in application software designed to measure and calculate the incorporation of Cy3, Cy5, fluorescein, or other user-specified dyes into cDNA probes. This is essential information for optimizing the concentration of each labeled probe before use in microarray hybridizations.

UV/visible scans of each probe are displayed on the high-resolution display so that the integrity of the nucleic acid and fluorophore components of each probe can be inspected. Yield, fluorophore content, and efficiency of incorporation are automatically calculated and displayed when starting RNA concentration and dilution factors are entered. The software is particularly suitable for probes labeled with CyScribe fluorescent labeling kits.

An 8-position sample changer is supplied as standard and the instrument will print out to standard Centronics parallel printers and export results to a PC. With its extensive range of built-in software, a wide range of accessories (including a Sipper option) and GLP self-test diagnostics, Ultrospec 3100 *pro* is a reliable, compact and integrated system for use in any busy laboratory, including those which require data storage to a PC. Ultrospec 3100 *pro* can also be used in conjunction with SWIFT II Applications Software, if required.

For conversion data for nucleic acids and proteins, see the Technical Appendix.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 3100 *pro*, Classic	1	80-2112-31*
Ultrospec 3100 *pro*, Yellow	1	80-2112-32*
Ultrospec 3100 *pro*, Plum	1	80-2112-37*
Ultrospec 3100 *pro*, Apple	1	80-2112-38*

Includes: Automatic wavelength calibration on start up, 8-position cell changer, performance check, integral high resolution liquid crystal display with graphical user interface, integrated software with post-run calculations.
Available in a choice of colors.

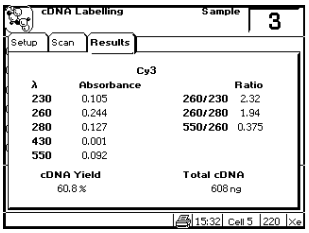
For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

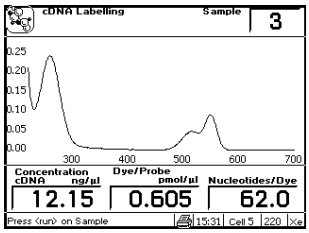
Related Products	Refer To
SWIFT II Applications Software	page 655
UV/Visible Cells	page 651
Amersham CyScribe First-Strand cDNA Labeling Kit	page 338
Amersham CyScribe Post-Labeling Kit	page 339
Amersham CyScribe Direct mRNA Labeling Kit	page 340

TECHNICAL SPECIFICATIONS

Wavelength range	190–900 nm
Bandwidth	< 3 nm
Absorbance range	-3.000 to 3.000
Safety certifications	CE 89/336/EEC (EMC directive) CE 73/23/EEC (LVdirective) EN-61010-1 (IEC1010-1)

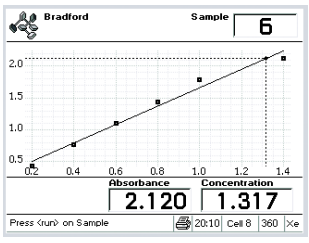


Screen shot of all calculated results and useful ratios.



Screen shot of Cy3-labeled cDNA probe scan showing raw scan data and calculated values.

Ultrospec 3100 *pro* printer stand and a Seiko DPU-414 thermal printer. Shown in Classic color option.



Ultrospec 3100 *pro* display (protein determination using Bradford method).

Spectrophotometry

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Supported by Labcrew

Ultrospec 2100 *pro* UV/Visible Spectrophotometer

Offers high performance and versatility at an attractive price. Shown in Classic color option.

- ***Robust, compact and reliable for general laboratory measurements.***
- Xenon lamp for longer lifetime by incorporating press-to-read technology and lower running costs (three year lamp warranty).
- Provides stored routines for DNA, RNA and oligonucleotide quantitation and purity check.
- Combines basic measurement modes with enhanced software functionality and method storage.
- Can be upgraded with SWIFT II Applications Software to form a powerful system.
- Includes serial and parallel outputs as standard.

Ultrospec 2100 *pro* UV/Visible Spectrophotometer is a simple to use instrument with advanced performance. In addition to measuring absorbance and concentration, it provides stored routines for nucleic acid quantitation and also a standard curve routine for protein determination. Wavelength scan with zoom, absorbance changes with time, reaction rate determinations, and standard curves can be displayed and printed out. User defined equations can be entered using the multi-wavelength mode and up to 18 methods can be saved. The instrument can be upgraded for more sophisticated applications, as well as data storage, with SWIFT II Applications Software and a PC.

With its large sample compartment, wide range of accessories such as the sipper option for high-throughput customers, and GLP self-testing diagnostics, Ultrospec 2100 *pro* is a versatile and reliable instrument for use in any laboratory.

For conversion data for nucleic acids and proteins, see the Technical Appendix.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 2100 *pro*, Classic	1	**80-2112-21***
Ultrospec 2100 *pro*, Yellow	1	**80-2112-22***
Ultrospec 2100 *pro*, Plum	1	**80-2112-27***
Ultrospec 2100 *pro*, Apple	1	**80-2112-28***

Includes: Automatic wavelength calibration on start up, 8-position cell changer, serial and parallel Centronics interfaces.
Available in a choice of colors.

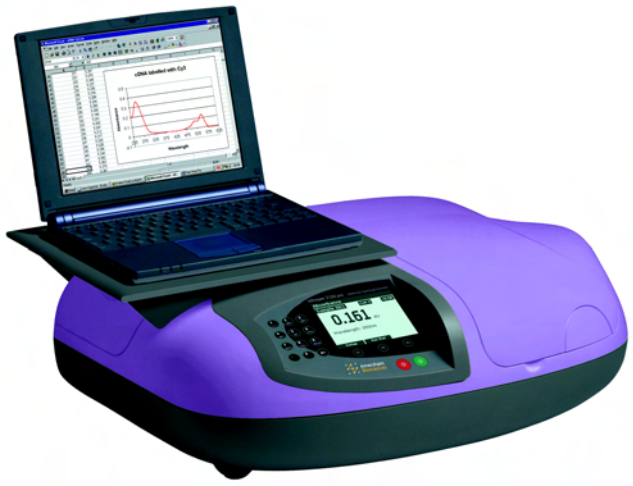
For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

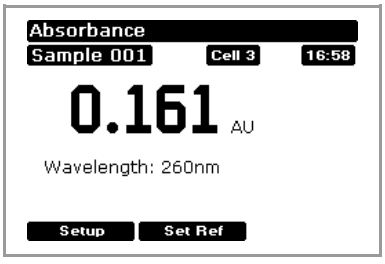
Related Products	Refer To
SWIFT II Applications Software	page 655
UV/Visible Cells	page 651
Accessories for Spectrophotometers	page 652

TECHNICAL SPECIFICATIONS

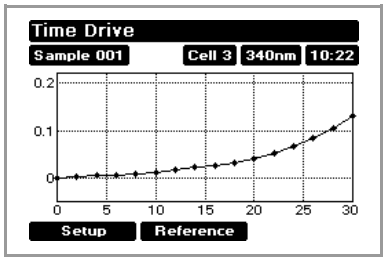
Wavelength range	190–900 nm
Bandwidth	< 3 nm
Absorbance range	-3.000 to 3.000
Safety certifications	CE89/336/EEC(EMCdirective) CE73/23/EEC(LVdirective) EN-61010-1 (IEC1010-1)



Ultrospec 2100 *pro* with portable PC, running SWIFT II software, mounted on PC support plinth. Shown in plum color option.



Ultrospec 2100 *pro* display (absorbance measurement).



Ultrospec 2100 *pro* display (simple kinetics experiment).

Ultrospec 1100 *pro* UV/Visible Spectrophotometer

Supported by Labcrew

Ease-of-use and stylish design combined with good performance.

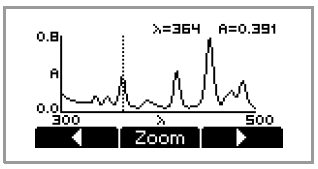
- ***Basic measurement modes coupled with enhanced software functionality and method storage.***
- Nucleic acid quantitation mode suitable for teaching laboratories.
- Graphics for scan, kinetics, and standard curve.
- Robust, compact, reliable, and very easy to use.
- Perfect for the biological science teaching and the industrial/quality control laboratory.
- Available in a choice of four exciting colors.

Ultrospec 1100 *pro* addresses the needs of both the biological science teaching and the industrial/quality control laboratory. The instrument has absorbance, percentage transmission, and factor concentration modes. Absorbance against time plots and scans are shown on the graphics display; there is also output directly to a spreadsheet or chart recorder.

Ultrospec 1100 *pro* has a 25-pin multipurpose output as standard, converting to serial or analog (for output to PC or chart recorder, respectively) with the appropriate interface. In addition, it can be used with standard parallel printers. The instrument can also be used in conjunction with SWIFT 1000 Applications Software.

The UV capability of the Ultrospec 1100 *pro* is important for nucleic acid quantitation and purity check experiments, which is now a vital part of many academic courses. In addition, the benefits of enhanced software functionality, including standard curve mode, reaction rate slope calculation, multiwavelength equation definition, and method storage/recall of up to nine user-defined methods, are available.

The instrument start-up menu can be customized so that the requirements of students and laboratory staff are met. As experimental or measurement needs change, the menu can be altered accordingly.



Output of scan to display.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 1100*pro* (Classic)	1	80-2112-00
Ultrospec 1100*pro* (Yellow)	1	80-2112-01
Ultrospec 1100*pro* (Plum)	1	80-2112-02
Ultrospec 1100*pro* (Apple)	1	80-2112-03
Accessories		
SWIFT 1000 Applications Software (includes interface lead)	1	80-2110-00
2-position manual cell changer, 10 mm pathlength	1	80-2109-04
Water heated cell holder, 10–40 mm pathlength (circulation bath required)	1	80-2109-06
Peltier heated cell holder (25, 30, 37°C) (Temperature Controller required)	1	80-2109-07
Temperature Controller	1	80-2109-01
Test tube holder (accommodates diameters of 8–25 mm and heights of up to 180 mm)	1	80-2109-33
Fitting kit for external sample delivery (peristaltic pump and 10 mm flow cell required)	1	80-2109-08
Spare Single Cell Holder, U500 / U1100 pro.	1	80-2109-09
Printer stand	1	80-2109-96
Tungsten Halogen lamp vertical filament	1	80-2106-16
Tungsten Halogen Lamp, Vertical Filament	1	80-2022-94*
Deuterium Lamp Assembly Includes W lamp, U1100 pro Only	1	80-2109-11
Interface for chart recorder	1	80-2109-03
Spreadsheet interface software	1	80-2109-02
Parallel printer cable	1	80-2071-87
Dust cover	1	80-2109-13

For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

Related Products	Refer To
SWIFT 1000 Applications Software	page 654
UV/Visible Cells	page 651
Accessories for Spectrophotometers	page 652

TECHNICAL SPECIFICATIONS

Wavelength range	200–900 nm
Bandwidth	5 nm
Absorbance range	-0.300 to 3.000
Safety certifications	CE 89/336/EEC (EMC directive) CE 73/23/EEC (LVdirective) EN-61010-1 (IEC1010-1)

Test tube holder.

Variable Wavelength Spectrophotometers

NanoVue Spectrophotometer *NEW*

- ***For the reliable measurement of nucleic acid and protein samples.***
- Eliminates the need for cuvettes, capillaries or other sample devices—simply drop and read.
- Assays low volumes of 0.5 µl to 5 µl with accuracy thus conserving precious samples.
- Predefined methods for nucleic acid and protein quantitation, and protein assays.
- Fast instrument startup with automatic self-calibration.
- Provides Intuitive software for ease of use and large, easy-to-read graphical display

NanoVue spectrophotometer is an easy-to-use and reliable instrument for the measurement of nucleic acid and protein samples. Samples of 0.5 µl to 2 µl can be pipetted directly onto a novel sample plate for measurement, and then simply recovered using a pipette. If sample recovery is not required, the sample plate can be quickly and easily wiped clean.

NanoVue spectrophotometer provides a range of pre-stored methods for the determination of RNA, DNA, and oligonucleotide concentrations and purity, plus wavelength scanning to detect impurities. Concentration measurements can be displayed in choice of units (µg/ml, ng/µl, µg/µl, pmol/µl, and pmol). Oligonucleotide primers can be characterized by keying in the base sequence (up to 66-mer) to obtain parameters such as conversion factor (µg/ml), molecular weight, theoretical absorbance (AU/µmol), and theoretical T_m. Proteins can be quantitated by BCA, Biuret, Bradford, Direct UV and Lowry, with the ability to run up to 27 standards.

ORDERING INFORMATION

Product	Quantity	Code Number
NanoVue with integrated printer (US and Canada only) *NEW*	1	28-9244-02*
NanoVue (US and Canada only) *NEW*	1	28-9244-03*
NanoVue with wireless connectivity (US and Canada only) *NEW*	1	28-9244-04*
NanoVue with integrated printer *NEW*	1	28-9232-15*
NanoVue *NEW*	1	28-9232-16*
NanoVue with wireless connectivity *NEW*	1	28-9232-17*
Accessories		
Pathlength Calibration Kit	1	28-9244-05
Sample Plate Replacement kit	1	28-9244-06

For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

TECHNICAL SPECIFICATIONS

Wavelength range	190 - 1100 nm
Monochromator	Flat grating
Wavelength calibration	Automatic upon switch on
Spectral bandwidth	5 nm
Wavelength accuracy	± 0.02 nm
Wavelength reproducibility	± 0.1 nm
Light sources	Pulsed xenon lamp
Detector	1024 element CCD array
Photometric range	-0.300 to 2.500A, 0 to 199%T
Digital output	USB port standard, Bluetooth option
Dimensions	260 x 390 x 100 mm
Weight	<4.5 kg
Power input	18Vdc from a 90-250 V, 50/60 Hz, Max 30VA mains power pack
Safety Certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LVdirective); EN-61010-1 (IEC1010-1)

For new products and updated specifications, please visit www.gelifesciences.com/spectros.

Relevant parameters are calculated automatically and displayed at the touch of a button on a large display. Up to 90 user defined methods can be stored with optional password protection. Data output is via standard USB and PVC (print via Computer) software, allowing data to be transferred to a PC or with the integrated printer or wireless Bluetooth options.

Supported by Labcrew

GeneQuant 1300 Spectrophotometer

Easy to use with a large graphics display and flexible with wavelength scanning plus a large range of nucleic acid purification, protein assays, CyDye, and cell culture density.

- ***Predefined methods for nucleic acid purification, protein assays, CyDye, and cell culture density measurements.***
- Wavelength scanning of nucleic acid samples for purity checks.
- Storage for 90 user-defined methods with (optional) password protection.
- Large, easy-to-read graphical display.
- Optional built-in printer or output data via USB to a PC for printing or storage.
- Wireless bluetooth connectivity (optional).
- Optics with no moving parts for high-energy throughput combined with a Xenon lamp for a long lifetime.
- Three-year lamp warranty.

GeneQuant 1300 has a wide range of pre-stored methods for DNA, RNA and oligonucleotide purity, and concentration measurements. Visual inspection of a nucleic acid scan can quickly alert you to the presence of impurities—this is especially useful for RNA samples. GeneQuant 1300 is suitable for determining the concentration (in µg/ml, ng/µl, µg/µl, pmol/µl, and pmol) and purity of nucleic acids after hybridization, PCR, and plasmid DNA minipreps. GeneQuant 1300 can correct for differences in cell pathlengths and dilution factors. Oligonucleotide primers can be characterized by keying in the base sequence (up to 66mer) to obtain a conversion factor (µg/ml), molecular weight, theoretical absorbance (AU/µmol), and theoretical T_m.

For licensing information, see back of catalog.

ORDERING INFORMATION

Product	Quantity	Code Number
GeneQuant 1300, Classic *NEW*	1	28-9182-13*
GeneQuant 1300, Classic, with printer *NEW*	1	28-9182-14*
GeneQuant 1300, Classic, with bluetooth *NEW*	1	28-9182-15*
Accessories and other items for GeneQuant 1300		
Bluetooth Accessory for GeneQuant 1300, Classic *NEW*	1	28-9182-25
Spare printer paper (20 rolls) *NEW*	1	28-9182-26
GeneQuant 1300 Printer Accessory *NEW*	1	28-9182-27

For pricing information, visit www.gelifesciences.com/orderonline

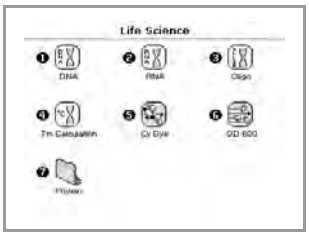
** Availability varies by region - please contact your local GE Healthcare office for details.*

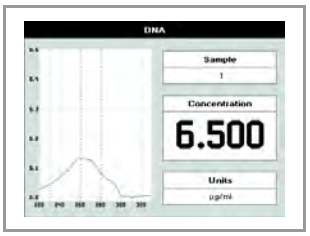
Not for sale in Canada.

Related Products	Refer To
UV/Visible Cells	page 651

TECHNICAL SPECIFICATIONS

Wavelength range	190-1100nm
Bandwidth	5 nm
Safety certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LVdirective); EN-61010-1 (IEC1010-1)





Windows-style software makes application selection easy. Display shows a spectral scan of a nucleic acid sample.

Proteins can be quantitated by BCA, Biuret, Bradford, Direct UV, and Lowry assays with the ability to run up to 27 standards. GeneQuant 1300 can be used to measure the OD of bacterial cell culture solutions to optimize harvest times. Incorporation of Cy3, Cy5, fluorescein, and user-specified dyes into purified microarray hybridization probes or PCR products can be measured. The kinetics mode allows a plot of absorbance against time to be supplemented with ΔA/min; hence you can calculate the correlation coefficient for the duration of an assay—this can be converted directly to rate of reaction.

Relevant parameters are calculated automatically and displayed at the touch of a button on a large display. Samples as low as 3µl can be analyzed using a capillary cell system. A wide range of standard cuvettes may be used depending on the sensitivity or volume requirements. The 15mm optical beam height makes the GeneQuant 1300 compatible with low volume quartz and disposable UV plastic cuvettes.

GeneQuant 1300 Spectrophotometer (continued)

SELECTION GUIDE – Cells for use with GeneQuant 1300				
Sample concentration range after dilution (ng/µl)*	**Available sample volume (µl)**	**Suggested cell type**	**Pathlength (mm)**	**Code number**
5–125	> 2000	standard quartz	10	80-2002-58
	> 800	semi-micro disposable	10	80-3000-77
	< 800	semi-micro quartz	10	80-2002-77
	> 70	microvolume quartz	10	80-2103-69
	> 70	microvolume disposable	10	80-3000-81
10–250	> 7	ultra microvolume quartz†	5	80-2103-68
100–2500‡	> 3	Capillary cell for GeneQuant 100 or GeneQuant 1300	0.5	80-2120-19
		spare capillaries (100)		80-2104-67

** Assuming dsDNA with A_{260} = 1.0 for 50 µg/ml (= ng/µl) in a 10 mm pathlength cell.*

† This is supplied with a micro-sample viewer accessory.

‡ Note that dilution may not be required for a miniprep/PCR amplification where typical concentrations are between 50 and 200 ng/µl.

GeneQuant 100 Spectrophotometer *NEW*

- ***Predefined methods for nucleic acid purification, protein assays and cell culture density measurements***
- Large, easy-to-read graphical display
- Optional built-in printer or output data via USB to a PC for printing or storage
- Optics with no moving parts for high energy throughput combined with a Xenon source for long lamp life time
- Three-year lamp warranty

Applications

Pre-stored methods for DNA, RNA and oligonucleotide purity, and concentration (in µg/ml, ng/µl, µg/µl, pmol/µl, and pmol) measurements. Visualization of nucleic acid scan allows impurities to be detected, particularly useful for RNA samples Proteins can be quantitated by BCA, Biuret, Bradford, Direct UV and Lowry. The OD of bacterial cell culture solutions can be measured to optimize harvest times.

Software and User interface

Relevant parameters are calculated automatically and displayed at the touch of a button on a large display.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
GeneQuant 100, Classic *NEW*	1	**28-9182-04***
GeneQuant 100, Classic with Printer *NEW*	1	**28-9182-05***

For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

TECHNICAL SPECIFICATIONS	
Wavelength range	190 - 900nm
Bandwidth	5nm
Safety Certifications	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LVdirective); EN-61010-1 (IEC1010-1)

For new products and updated specifications, please visit www.gelifesciences.com/spectros.

SELECTION GUIDE – Cells for use with GeneQuant 100				
Sample concentration range after dilution (ng/µl)*	**Available sample volume (µl)**	**Suggested cell type**	**Pathlength (mm)**	**Code number**
5–125	> 2000	standard quartz	10	80-2002-58
	> 800	semi-micro disposable	10	80-3000-77
	< 800	semi-micro quartz	10	80-2002-77
	> 70	microvolume quartz	10	80-2103-69
	> 70	microvolume disposable	10	80-3000-81
10–250	> 7	ultra microvolume quartz†	5	80-2103-68
100–2500‡	> 3	capillary	0.5	80-2120-19
		spare capillaries (100)		80-2104-67

** Assuming dsDNA with A_{260} = 1.0 for 50 µg/ml (= ng/µl) in a 10 mm pathlength cell.*

† This is supplied with a micro-sample viewer accessory.

‡ Note that dilution may not be required for a miniprep/PCR amplification where typical concentrations are between 50 and 200 ng/µl.

Sample size

Samples as low as 3µl can be analysed using a capillary cell system. A wide range of standard cuvettes may be used depending on the sensitivity or volume requirements. The 15mm optical beam height makes the GeneQuant 100 compatible with low volume quartz and disposable UV-transmitting plastic cuvettes.

Ultrospec 500 *pro* Visible Spectrophotometer

Supported by Labcrew

Ideal for the biological science teaching laboratory.

- ***Basic measurement modes coupled with enhanced software functionality and method storage.***
- Graphics for scan, kinetics, and standard curve.
- Robust, compact, reliable, and very easy to use.
- Suitable for the biological science teaching laboratory.
- Available in a choice of four colors.

Ultrospec 500 *pro* is a visible only spectrophotometer that addresses the needs of the biological science teaching laboratory. The instrument has absorbance, percentage transmission, and factor concentration modes. Absorbance against time plots and scans are shown on the graphics display; there is also output directly to printer, spreadsheet, or chart recorder.

The benefits of enhanced software functionality, including standard curve mode, reaction rate slope calculation, multi-wavelength equation definition, and method storage/recall of up to nine user-defined methods, are available.

The instrument startup menu can be customized so that the requirements of students and laboratory staff are met. As experimental or measurement needs change, the menu can be altered accordingly.

Ultrospec 500 *pro* has a 25-pin multipurpose output as standard, converting to serial or analog (for output to PC or chart recorder, respectively) with the appropriate interface. In addition, it can be used with standard parallel printers. Ultrospec 500 *pro* can also be used in conjunction with SWIFT 1000 Applications Software.

ORDERING INFORMATION

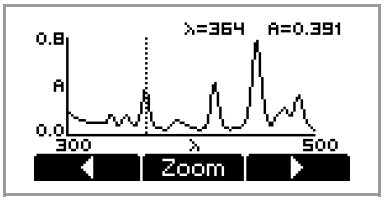
Product	Quantity	Code Number
Ultrospec 500 *pro*, Classic	1	80-2112-50
Ultrospec 500 *pro*, Yellow	1	80-2112-51
Ultrospec 500 *pro*, Plum	1	80-2112-52
Ultrospec 500 *pro*, Apple	1	80-2112-53
Accessories		
SWIFT 1000 Applications Software (includes interface lead)	1	80-2110-00
2-position manual cell changer, 10 mm pathlength	1	80-2109-04
Water heated cell holder, 10–40 mm pathlength (circulation bath required)	1	80-2109-06
Peltier heated cell holder (25, 30, 37°C) (Temperature Controller required)	1	80-2109-07
Temperature Controller	1	80-2109-01
Test tube holder (accommodates diameters of 8–25 mm and heights of up to 180 mm)	1	80-2109-33
Fitting kit for external sample delivery (peristaltic pump and 10 mm flow cell required)	1	80-2109-08
Spare Single Cell Holder, U500 / U1100 pro.	1	80-2109-09
Printer stand	1	80-2109-96
Tungsten Halogen Lamp, Vertical Filament	1	80-2022-94
Deuterium Lamp Assembly Includes W lamp, U1100 pro Only	1	80-2109-11
Interface for chart recorder	1	80-2109-03
Spreadsheet interface software	1	80-2109-02
Parallel printer cable	1	80-2071-87
Spare User Manual (multi language)	1	80-2112-04
Dust cover	1	80-2109-13

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
SWIFT 1000 Applications Software	page 654
Visible Cells	page 652
Visible Cells	page 652

TECHNICAL SPECIFICATIONS

Wavelength range	325–900 nm
Bandwidth	5 nm
Absorbance range	-0.300 to 3.000
Safety certifications	CE 89/336/EEC (EMC directive) CE 73/23/EEC (LVdirective) EN-61010-1 (IEC1010-1)



Output of scan to display.

Supported by Labcrew

Novaspec Plus Visible Spectrophotometer

Novaspec Plus is an easy-to-use, highly reliable and low-maintenance instrument.

- ***"Flash Scan" diode array.***
- Stored protein methods.
- Bacterial cell culture measurement at OD_{600}.
- Kinetics for activity studies.
- Stored methods.
- Grafico PC utility software.

Novaspec Plus is suitable for general biotech laboratory use. It includes stored methods for Bradford, BCA, Biuret, and Lowry protein quantitation, in addition to the basic modes of absorbance, transmittance, OD_{600}, and concentration. The use of diode array technology permits rapid wavelength scans to be made, and, as there are no moving parts, makes for a highly reliable and low-maintenance instrument.

The large backlit screen displays graphical results for wavelength scans, kinetic assays (including slope calculation for rate/activity studies) and standard curves. Up to 99 methods can be stored for instant recall. The Novaspec Plus is delivered with Grafico, a PC utility software package, and the requisite serial lead, providing you with the means to capture, print and store data from the instrument (with a time/date stamp) onto a PC so that a results log can be built up or data exported to Microsoft Excel.

ORDERING INFORMATION

Product	Quantity	Code Number
Novaspec Plus	1	80-2117-50*
Novaspec Plus with heated cell holder	1	80-2117-51
Includes: Grafico PC utility software, serial cable, dust cover.		
Accessories and other items		
Test tube adapters (10, 12, 16 mm)	1	80-2117-47
Chart recorder interface cable	1	80-3003-55
Lamp Assembly. Tungsten	1	80-2115-33*

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Visible Cells	page 652
Other Spectrophotometer Cells and Cell Accessories	page 652

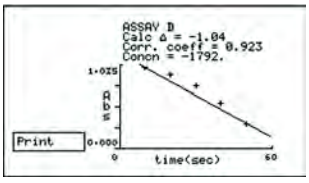
** Availability varies by region - please contact your local GE Healthcare office for details.*

The cell holder supplied with Novaspec Plus accepts standard 10 mm pathlength glass or plastic cells (adapters are available to convert it to accept 10, 12 and 16 mm diameter test tubes). It can be removed for cleaning, or flushed through with water *in situ*, if spillages occur.

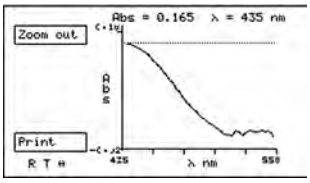
For users who require temperature control, particularly for kinetics studies and use with test kits, a special version of NovaspecPlus is available with a factory-installed heated cell holder (37°C only); note that this cell holder must be factory installed and cannot be added after purchase.

TECHNICAL SPECIFICATIONS

Wavelength range:	330–800 nm
Bandwidth:	7 nm
Absorbance range:	-0.300 to 2.50
Safety certifications:	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1)



Output of kinetics to display.



Output of scan to display.

Supported by Labcrew

Novaspec III Visible Spectrophotometer

Novaspec III is robust, compact, reliable and versatile; ideal for the student environment.

- ***Large display with easy-to-read characters.***
- Absorbance, % Transmission, Concentration, Factor and Rate.
- Self-test on startup.
- Removable cell/test tube holder for easy cleaning.
- Analogue output for connection to chart recorder.
- Grafico PC utility software, including tutorial.

Novaspec III has been designed for use in the student teaching laboratory. It is a rugged, light-in-weight instrument with no moving parts, making it both highly portable and highly reliable. A fully automatic calibration at startup gives confidence in its use.

Novaspec III has a large display so that small groups of students can work around the instrument and view the results. It will only measure in the modes of interest to this category of user—absorbance, % transmission, concentration and rate—yet, with the supplied Grafico utility software, each instrument has the capability to download to a PC all results and a full wavelength range scan (the requisite serial lead is also included). Grafico also includes a full tutorial on the technique of UV/Visible Spectrophotometry. A combination of Novaspec III and the three experimental protocols for students described in the user manual provides an excellent package for technical staff.

ORDERING INFORMATION

Product	Quantity	Code Number
Novaspec III	1	**80-2118-00**
Accessories and other items		
Test tube adapters (10, 12, 16 mm)	1	**80-2117-47**
Chart recorder interface cable	1	**80-3003-55**
Lamp Assembly. Tungsten	1	**80-2115-33**

For pricing information, visit www.gelifesciences.com/orderonline

Related Products	Refer To
Visible Cells	page 652
Other Spectrophotometer Cells and Cell Accessories	page 652

The instrument is extremely easy to use; just select wavelength, set reference, and measure sample. In rate mode, a kinetics assay can be followed at two wavelengths simultaneously; for the first time on this level of product, the student can follow in real time both the increase in absorbance as product is formed with the concomitant decrease as reactant is used up.

The cell holder supplied with Novaspec III accepts standard 10 mm pathlength glass or plastic cells (adapters are available to convert it to accept 10, 12, and 16 mm diameter test tubes). The cell holder can be removed for cleaning, or flushed through with water *in situ*.

TECHNICAL SPECIFICATIONS

Wavelength range:	330–800 nm
Bandwidth:	7 nm
Absorbance range:	-0.300 to 2.50
Safety certifications:	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1)

Cell Density Meter

Supported by Labcrew

Ultrospec 10 Cell Density Meter

Ultrospec 10 is suitable for cell density OD measurements.

- ***Small, portable, and dedicated cell density OD_{600} measurement instrument.***
- Battery operated for use where cells are actually cultured.
- Easy to use, easy to clean, easy to sterilize.
- Download results to a PC or printer for convenient data storage and retrieval.

The Ultrospec 10 Cell Density Meter measures the density of cells in suspension at 600 nm. Small, portable, and easy to use, the instrument can measure growth rates of *E. coli*, other bacteria, and yeast (it is not recommended for use with mammalian cell lines). The hand-held device can be easily employed in incubation cabinets, under anaerobic conditions, and in other areas in the laboratory where cells are cultured. Spillages can be easily wiped from the smooth surface, and the cell compartment area can be flushed with, for example, formaldehyde or ethylene oxide to sterilize it.

The Ultrospec 10 uses a 600 nm LED source in combination with an advanced fiber optic to obtain OD_{600} measurements, which are comparable to those obtained on a regular spectrophotometer. Measurements can be sent via a serial lead to a printer or can be downloaded to an appropriate program on a personal computer for analysis. Rechargeable batteries provide nearly one month of cord-free use.

ORDERING INFORMATION

Product	Quantity	Code Number
Ultrospec 10 Cell Density Meter, Classic	1	**80-2116-30***
Ultrospec 10 Cell Density Meter, Yellow	1	**80-2116-31***
Ultrospec 10 Cell Density Meter, Plum	1	**80-2116-32***
Ultrospec 10 Cell Density Meter, Apple	1	**80-2116-33***
Accessories		
S2000P serial printer (includes serial cable)	1	**80-3000-94***
Spreadsheet interface software (requires serial interface cable)	1	**80-2110-73**
Disposable Cells, 10 mm pathlength, minimum volume 2.5 ml, Methacrylate, pack of 100	1	**80-2004-53**
Disposable Cells, 10 mm pathlength, minimum volume 1.5 ml, Polystyrene, pack of 100	1	**80-2084-11***
Adapter set for 10 and 12 mm tubes	1	**80-3000-57***

For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

TECHNICAL SPECIFICATIONS

Wavelength	600 nm
Bandwidth	40 nm
Range	Optical density -0.3 to 1.99 A
Accuracy	< ± 0.05 A at 1 A using neutral density filters
Repeatability	± 0.02 A at 1 A
Cuvette holder	Fixed with drain hole. Accepts 10 mm pathlength semi-micro and macro cuvettes or 14–17 mm round tubes
Output	RS232
Memory	99 readings
Display	Custom LCD
Power requirements	External power adaptor (110–220 V) or internal rechargeable NiMH battery
Approximate dimensions	180 × 60 × 150 mm (W × H × D)
Weight	0.6 kg
Safety certifications:	CE 89/336/EEC (EMC directive); CE 73/23/EEC (LV directive); EN-61010-1 (IEC1010-1)

UV/Visible Cells

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
UV grade silica		
Standard rectangular cell with lid, 1 mm pathlength, 10 mm i.d., 200 µl working volume, 12.5 × 45 mm external dimensions	1	80-2002-54*
Standard rectangular cell with lid, 5 mm pathlength, 10 mm i.d., 1 ml working volume, 12.5 × 45 mm external dimensions	1	80-2002-57*
Standard rectangular cell with lid, 10 mm pathlength, 10 mm i.d., 2 ml working volume, 12.5 × 45 mm external dimensions	1	80-2002-58
	set of 2 (matched)	80-2099-89
	set of 8 (matched)	80-2109-80
Standard rectangular cell with lid, 50 mm pathlength, 10 mm i.d., 10 ml working volume, 52.5 × 45 mm external dimensions	1	80-2002-63
Semi-micro cell with lid and black walls, 10 mm pathlength, 4 mm i.d., 800 µl working volume, 12.5 × 45 mm external dimensions	1	80-2002-77
	set of 2 (matched)	80-2100-13
	set of 8 (matched)	80-2109-82
Micro cell with lid and black walls, 10 mm pathlength, 2 mm i.d., 400 µl working volume, 12.5 × 45 mm external dimensions	1	80-2002-95
	set of 2 (matched)	80-2100-25
	set of 8 (matched)	80-2109-83
Standard rectangular cell with stopper, 10 mm pathlength, 10 mm i.d., 2000 µl working volume, 12.5 × 48 mm external dimensions	1	80-2002-70
Semi-micro cell with stopper and black walls, 10 mm pathlength, 4 mm i.d., 800 µl working volume, 12.5 × 48 mm external dimensions	1	80-2002-81
	set of 2 (matched)	80-2100-22
Micro cell with stopper and black walls, 10 mm pathlength, 2 mm i.d., 400 µl working volume, 12.5 × 48 mm external dimensions	1	80-2002-99
Microvolume Cells		
Capillary cell, 0.5 mm pathlength, 3 µl working volume, UV grade silica (Includes 100 quartz capillaries and Cristaseal.)	1	80-2104-66
Capillary cell, 0.5 mm pathlength, 3 µl working volume, UV grade silica (Includes 100 quartz capillaries and Cristaseal.)	1	80-2120-19
Ultra microvolume cell with black walls, 5 mm pathlength, 5–7 µl working volume, 12.5 × 48 mm external dimensions, UV grade silica	1	80-2103-68
Microvolume cell with black walls, 10 mm pathlength, 50 µl working volume, UV grade silica	1	80-2076-38
Microvolume cell with black walls, 10 mm pathlength, 70 µl working volume, 12.5 × 48 mm external dimensions, UV grade silica	1	80-2103-69
Spare quartz capillaries (100), 0.5 mm pathlength, 3 µl working volume, UV grade silica (Cristaseal not included)	1	80-2104-67
Spare Cristaseal (10)	1	80-2109-79
Spare Micro Sample Viewer	1	80-2109-87
Disposable Cells		
Disposable Cells, 10 mm pathlength, minimum volume 70 µl, UV plastic, ultra-micro, pack of 100	1	80-3000-81†
Disposable Cells, 10 mm pathlength, minimum volume 800 µl, UV plastic, semi-micro, pack of 100	1	80-3000-77†

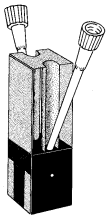
For pricing information, visit www.gelifesciences.com/orderonline

* *These cells are supplied with packing pieces to facilitate use in a standard 10 mm pathlength cell holder.*

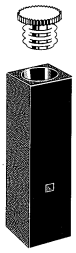
† *Availability varies by region - please contact your local GE Healthcare office for details.*

Capillary Cell Holder (80-2104-66).

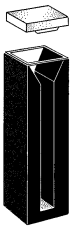
Microvolume cell with black walls (80-2076-38).



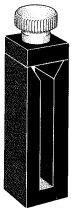
Ultra microvolume cell with black walls (80-2103-68).



Microvolume cell with black walls, including micro sample viewer (80-2103-69).



Semi-microcell with lid and black walls (80-2002-77).



Semi-microcell with stopper and black walls (80-2002-81).

Visible Cells

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Glass		
Standard rectangular cell with lid, 1 mm pathlength, 10 mm internal width, 200 µl working volume, 12.5 × 45 mm external dimensions	1	80-2003-83*
Semi-micro cell with lid and black walls, 10 mm pathlength, 4 mm internal width, 800 µl working volume, 12.5 × 45 mm external dimensions	1	80-2004-15
Standard rectangular cell with lid, 5 mm pathlength, 10 mm internal width, 1 ml working volume, 12.5 × 45 mm external dimensions	1	80-2003-85*
Standard rectangular cell with lid, 10 mm pathlength, 10 mm internal width, 2 ml working volume, 12.5 × 45 mm external dimensions	1	80-2003-87
	set of 8 (matched)	80-2109-81
Standard rectangular cell with lid, 50 mm pathlength, 10 mm internal width, 10 ml working volume, 52.5 × 45 mm external dimensions	1	80-2003-93
Standard rectangular cell with stopper, 10 mm pathlength, 10 mm internal width, 2000 µl working volume, 12.5 × 48 mm external dimensions	1	80-2003-98
Disposable		
Disposable Cells, 10 mm pathlength, minimum volume 1.5 ml, Polystyrene, pack of 100	1	80-2084-11
Disposable Cells, 10 mm pathlength, minimum volume 2.5 ml, Methacrylate, pack of 100	1	80-2004-53

For pricing information, visit www.gelifesciences.com/orderonline

* *These cells are supplied with packing pieces to facilitate use in a standard 10 mm pathlength cell holder.*

† *Availability varies by region - please contact your local GE Healthcare office for details.*

Other Spectrophotometer Cells and Cell Accessories

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Cyclindrical Cell		
Cylindrical Cell, 100 mm pathlength, 22 mm diameter, UV grade silica requires 80-2106-10 cylindrical cell holder.	1	80-2003-12
Test tubes		
Glass test tubes (pack of 10), marked for optical alignment 12 × 100 mm	1	80-2004-50
Continuous Flow-through Cells		
Continuous Flow-through Cell, 10 mm pathlength, 3 mm internal diameter, 75 µl volume, 12.5 × 45 mm external dimensions, UV grade silica	1	80-2003-05
Continuous Flow-through Cell, 10 mm pathlength, 4 mm internal diameter, 450 µl volume: 12.5 × 45 mm external dimensions, optical glass	1	80-2004-45
Sipper Flowcell		
Sipper Flowcell, 10 mm pathlength, 80 µl internal volume, UV grade silica (includes tubing kit)	1	80-2080-60
Cell Spacers		
Cell Spacers, for use with cells that have an 8.5 mm optical center (pack of 6)	1	80-2106-85
Packing Pieces		
1 mm pathlength cell packing pieces	1	80-2107-70
5 mm pathlength cell packing pieces	1	80-2107-71

For pricing information, visit www.gelifesciences.com/orderonline

Cell Holders

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Single Cell Holders		
Cell holder, up to 10 mm pathlength	1	80-2106-05
Cell holder, for use with magnetic flea, 10 mm pathlength (requires magnetic stirrer)	1	80-2108-10
Heated Single Cell Holders		
Water heated cell holder, 10-40 mm pathlength (requires circulation bath)	1	80-2106-08
Water heated cell holder, 10–40 mm pathlength (circulation bath required)	1	80-2109-06
Peltier heated cell holder (20-50°C), 10 mm pathlength, powered from instrument	1	80-2106-13
Programmable Peltier unit (20-105°C) and SWIFT-T_m Applications software (requires Temperature Control Unit and PC with serial port)	1	80-2106-14
Electrically heated cell holder (25, 30, 37°C), 10 mm pathlength, powered from instrument	1	80-2106-12
Spare Single Cell Holder, U500 / U1100 pro.	1	80-2109-09
Specialized Cell Holders		
Cell holder with 8 µl HPLC flow cell	1	80-2106-11
Cell holder, 10-50 mm pathlength	1	80-2106-07
Cell holder, 100 mm pathlength	1	80-2107-14
Cylindrical cell holder, 25 mm diameter, up to 100 mm pathlength	1	80-2106-10
Test tube holder (accommodates diameters of 8–25 mm and heights of up to 180 mm)	1	80-2109-33

For pricing information, visit www.gelifesciences.com/orderonline

Cell Changers

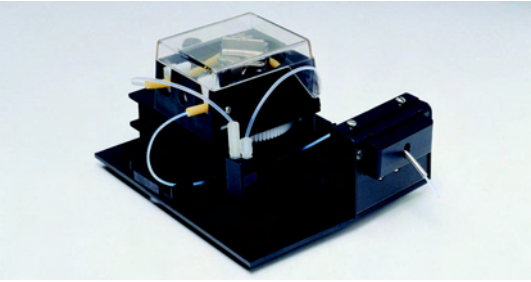
6-position Peltier heated cell changer (80-2106-04).

8-position water heated cell changer (80-2109-70).

ORDERING INFORMATION		
Product	Quantity	Code Number
4-position cell changer (10-50 mm pathlength)	1	80-2106-01
Spare 8-position cell changer, 10 mm pathlength	1	80-2108-01
6-position Peltier heated cell changer, 10 mm pathlength (requires Temperature Control Unit, see 80-2105-49)	1	80-2106-04
8-position water heated cell changer, 10 mm pathlength (requires circulation bath)	1	80-2109-70
2-position manual cell changer, 10 mm pathlength	1	80-2109-04

For pricing information, visit www.gelifesciences.com/orderonline

Sipper



ORDERING INFORMATION		
Product	Quantity	Code Number
Sipper, complete with UV quartz cell and all tubing (requires single cell holder 80-2106-05 or 80-2106-13)	1	80-2112-15
Marprene pump head tubes (6) for Sipper	1	80-2080-74
Viton pump head tubes (5) for Sipper	1	80-2106-99
PTFE flowcell tubing with connectors	1	80-2055-13

For pricing information, visit www.gelifesciences.com/orderonline

Temperature Control Unit

ORDERING INFORMATION		
Product	Quantity	Code Number
Temperature Control Unit	1	80-2105-49

For pricing information, visit www.gelifesciences.com/orderonline

Printers

ORDERING INFORMATION		
Product	Quantity	Code Number
Printer Stand for Seiko DPU-414 thermal printer (Ultrospec 2100 *pro*/3100 *pro*/6300 *pro* only)	1	80-2112-13
S2000P serial printer (includes serial cable)	1	80-3000-94

For pricing information, visit www.gelifesciences.com/orderonline

System Control Software

Accessories for Fluorometers

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
Hoechst 33258 Dye	100 mg	80-6226-87
Calf Thymus DNA, Fluorescence standard (dried)	250 µg	80-6227-06
4-MU standard kit 4-methylumbelliferone	100 mg	80-6227-25
Performance Validation kit	1	80-6252-52
Glass fluorometry cuvette	1	80-6227-44
Capillary adapter kit	1	80-6227-63
Includes: 10, 50, and 100 µl capillary tubes (20 of each).		
Capillary tubes, 10 µl	100	80-6227-82
Capillary tubes, 50 µl	100	80-6228-20
Capillary tubes, 100 µl	100	80-6228-01
Capillary Cuvette adapter kit	1	80-6228-39
Includes: 9 µl capillary tubes (250 per package).		
Capillary tubes, 9 µl, glass	250	80-6228-58

For pricing information, visit www.gelifesciences.com/orderonline

21 CFR part 11 compliant SWIFT II Applications Software

- ***Full password protection; electronic records and signatures compliant.***
- Full audit trail.
- All the functionality of standard SWIFT II Method software.
- Compatible with Ultrospec 2100, 3100, 3300, 4300, 5300 and 6300 *pro*.

21 CFR part 11 SWIFT II Applications Software provides full FDA compliance in terms of electronic records and signatures with the flexibility and functionality of the established SWIFT II software, suitable for any analytical or QC laboratory that operates within such an environment. The software comprises both client and server applications for networked installations, but both of these can be installed on one PC if required.

When combined with the fully Pharmacopoeia compliant Ultrospec 6300 *pro* and 5300 *pro* instruments, extremely powerful and sophisticated systems are generated. Note that as in any 21 CFR part 11 compliant environment, it is incumbent on the end user to have the necessary standard operating procedures (SOPs) and training in place to ensure optimal use of the equipment.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
21 CFR part 11 compliant SWIFT II software	1	80-2117-57
Includes: wavelength scanning, reaction kinetics, time drive, quantitation, multi-wavelength, fraction analysis, culture, and T_m. No serial interface cable included.		
RS232C Serial Interface Cable	1	80-2105-97

For pricing information, visit www.gelifesciences.com/orderonline

Personal Computer Specification

21 CFR part 11 compliant SWIFT II software requires a PC or network with one of the following Microsoft Windows operating systems to be installed:
- NT 4.0 with Service Pack 6.
- 2000 with Service Pack 2 or 3.
- XP with Service Pack 1.

Additionally, at least one NTFS (New Technology Filing System) formatted directory must be available to use the software (note that FAT and HPFS are not acceptable). Contact GE Healthcare for further information.

SWIFT 1000 Applications Software

SWIFT 1000 Applications Software provides application modules for wavelength scanning, reaction kinetics and quantitation for the Ultrospec 500 *pro* and Ultrospec 1100 *pro* instruments.

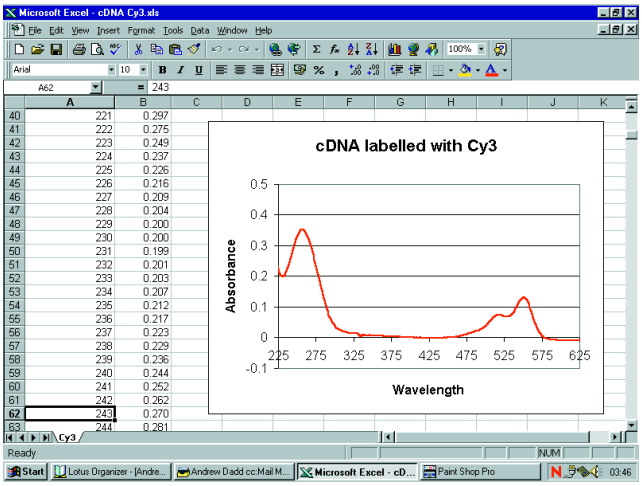
Personal computer specification

For optimum performance, an IBM-compatible 486, or greater, personal computer running Microsoft Windows 95, 98, NT, or 2000 is required. The PC should have a minimum of 8-Mb RAM, 200-Mb hard disk, a CD drive, a serial mouse installed, one free COMMS serial port and VGA graphics. Any printer supported by Microsoft Windows 95, 98, NT, or 2000 can be used. Contact GE Healthcare for further information.

ORDERING INFORMATION		
Product	**Quantity**	**Code Number**
SWIFT 1000 Applications Software (includes interface lead)	1	80-2110-00
Includes: wavelength scanning, reaction kinetics, quantitation, interface lead. (For use with Ultrospec 1100 pro and Ultrospec 500 pro only.)		

For pricing information, visit www.gelifesciences.com/orderonline

SWIFT II Applications Software



Export of a wavelength scan to Microsoft Excel.

- ***Includes an audit trail (data log) facility in each module.***
- Print preview of results, with format customization.
- Excellent export to spreadsheet capabilities.

SWIFT II Applications Software provides application modules for wavelength scanning, reaction kinetics, quantitation, multi-wavelength, time drive, fraction analysis, T_m and high throughput bacterial cell culture work. These comprehensive software modules are proven, and excellent for people who wish to export results to Microsoft Excel (essential for consistent report preparation).

ORDERING INFORMATION

Product	Quantity	Code Number
SWIFT II-METHOD	1	80-2108-31
Includes: wavelength scanning, reaction kinetics, time drive, quantitation, multi-wavelength, fraction analysis, cell culture, and T_m. No interface lead included.		
SWIFT II-SPECIALIST	1	80-2111-91
Includes: multi-wavelength, time drive, fraction analysis, cell culture and T_m. No interface lead included.		
SWIFT II-LAB	1	80-2108-26
Includes: wavelength scanning, reaction kinetics, quantitation. No interface lead included.		

For pricing information, visit www.gelifesciences.com/orderonline

The top of the range package, SWIFT II–METHOD, comprises all of the modules on a CD–ROM, and is supplied as standard with the Ultrospec 5300 *pro* UV/Visible Spectrophotometer. The entry level package, SWIFT II–LAB, caters for the fundamental applications of scanning, kinetics, and quantitation. The less frequently used applications of multiwavelength, time drive, fraction analysis, cell culture, and T_m, have been combined into a single package, SWIFT II–SPECIALIST.

Personal Computer Specification

For optimum performance, an IBM-compatible 486, or greater, personal computer running Microsoft Windows 95, 98, NT, 2000 or XP is required. The PC should have a minimum of 8-Mb RAM, 200-Mb hard disk, a CD drive, a serial mouse installed, one free COMMS serial port and VGA graphics. Any printer supported by Microsoft Windows 95, 98, NT, 2000, or XP can be used. Contact GE Healthcare for further information.

Spreadsheet interface software

- ***Provides the facility to export results directly to Microsoft Excel.***

The Spreadsheet Interface Software provides the facility to export results directly to an Excel Spreadsheet. For instance, scan comprising data such as absorbance / wavelength, may be picked up as columns of numbers and converted to a more conventional graph using the spreadsheet. Results may then be formatted or manipulated as appropriate prior to inclusion in reports or archiving.

ORDERING INFORMATION

Product	Quantity	Code Number
Spreadsheet interface software	1	80-2109-02
Compatible with Ultrospec 500 pro, Ultrospec 100 pro, and GeneQuant pro. Includes serial interface cable.		
Spreadsheet interface software (requires serial interface cable)	1	80-2110-73
Compatible with Ultrospec 2100 pro and Ultrospec 3100 pro. Serial interface cable must be purchased separately.		
RS232C Serial Interface Cable	1	80-2105-97

For pricing information, visit www.gelifesciences.com/orderonline

Installation Qualification/Operational Qualification (IQ/OQ) *NEW*

IQ/OQ consists of an IQ/OQ document and the related IQ/OQ performance on-site. It covers:

- Inspection of goods supplied, instrument, PC, and software
- Basic operation of installed soft- and hardware
- SWIFT II — SWIFT II CFR software qualification
- Verification of:
  - Wavelength accuracy
  - Wavelength repeatability
  - Spectral bandwidth
  - Absorbance accuracy
  - Photometric reproducibility
- Accessories qualification

ORDERING INFORMATION

Product	Quantity	Code Number
IQ/OQ performance for Ultrospec *NEW*	1	28-9137-70*
IQ/OQ Documentation for Ultrospec *NEW*	1	80-2118-62

For pricing information, visit www.gelifesciences.com/orderonline

** Availability varies by region - please contact your local GE Healthcare office for details.*

IQ/OQ Service can be provided for the following instruments:

- Ultrospec 2100pro
- Ultrospec 3100pro
- Ultrospec 5300pro
- Ultrospec 6300pro

For older instruments, please, contact your local GE Healthcare representative for details.